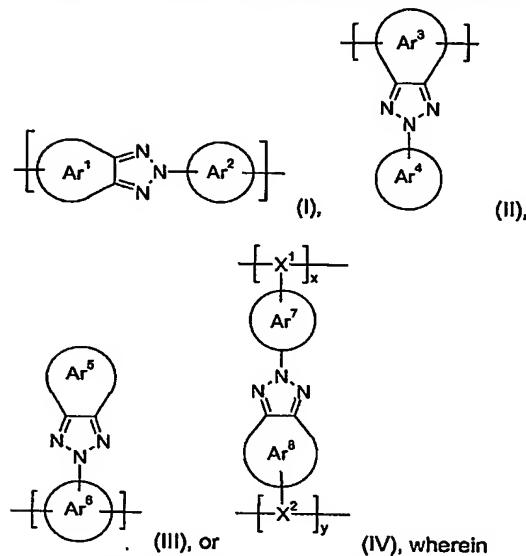


Claims

1. A polymer comprising a repeating unit of the formula



x and y are independently of each other 0 or 1,

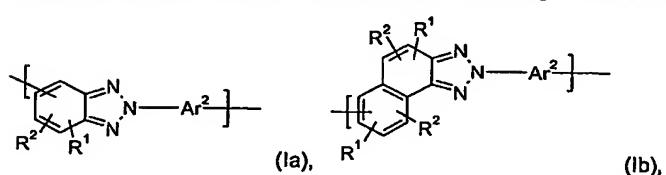
X¹ and X² are independently of each other a divalent linking group,

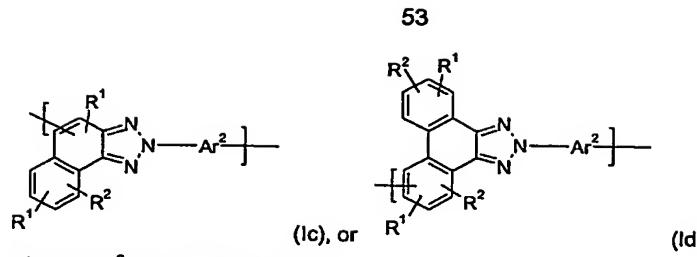
Ar¹, Ar², Ar³, Ar⁴, Ar⁵, Ar⁶, Ar⁷ and Ar⁸ are independently of each other an aryl group, or

a heteroaryl group, which can optionally be substituted, especially a C₆-C₃₀aryl group, or

10 or a C₂-C₂₆heteroaryl group, which can optionally be substituted.

2. A polymer according to claim 1, comprising a repeating unit of the formula





wherein Ar^2 is as defined in claim 1,

(Id),

R^1 and R^2 are independently of each other H, halogen, SO_3^- , C_1-C_{18} alkyl, C_1-C_{18} alkyl which is substituted by E and/or interrupted by D, C_1-C_{18} perfluoroalkyl, C_6-C_{24} aryl, C_6-C_{24} aryl which is substituted by G, C_2-C_{20} heteroaryl, C_2-C_{20} heteroaryl which is substituted by G, C_2-C_{18} alkenyl, C_2-C_{18} alkynyl, C_1-C_{18} alkoxy, C_1-C_{18} alkoxy which is substituted by E and/or interrupted by D, C_7-C_{25} aralkyl, or $-CO-R^{28}$.

or two substituents R^1 and R^2 , which are adjacent to each other, are a group.



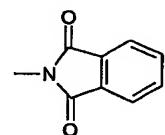
or



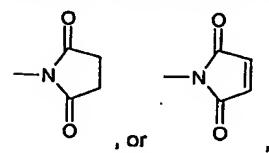
D is $-\text{CO}-$; $-\text{COO}-$; $-\text{S}-$; $-\text{SO}-$; $-\text{SO}_2-$; $-\text{O}-$; $-\text{NR}^{25}-$; $-\text{SiR}^{30}\text{R}^{31}-$; $-\text{POR}^{32}-$; $-\text{CR}^{23}=\text{CR}^{24}-$; or $-\text{C}=\text{C}-$; and

E is $-\text{OR}^{28}$; $-\text{SR}^{29}$; $-\text{NR}^{25}\text{R}^{28}$; $-\text{COR}^{28}$; $-\text{COOR}^{27}$; $-\text{CONR}^{25}\text{R}^{28}$; $-\text{CN}$; $-\text{OCOOR}^{27}$; or halogen; G is E, or $\text{C}_1\text{-C}_6$ alkyl, wherein

R^{23} , R^{24} , R^{25} and R^{26} are independently of each other H; C_6-C_{18} aryl; C_6-C_{18} aryl which is substituted by C_1-C_{18} alkyl, or C_1-C_{18} alkoxy; C_1-C_{18} alkyl; or C_1-C_{18} alkyl which is interrupted by $-O-$; or



R^{25} and R^{28} together form a five or six membered ring, in particular



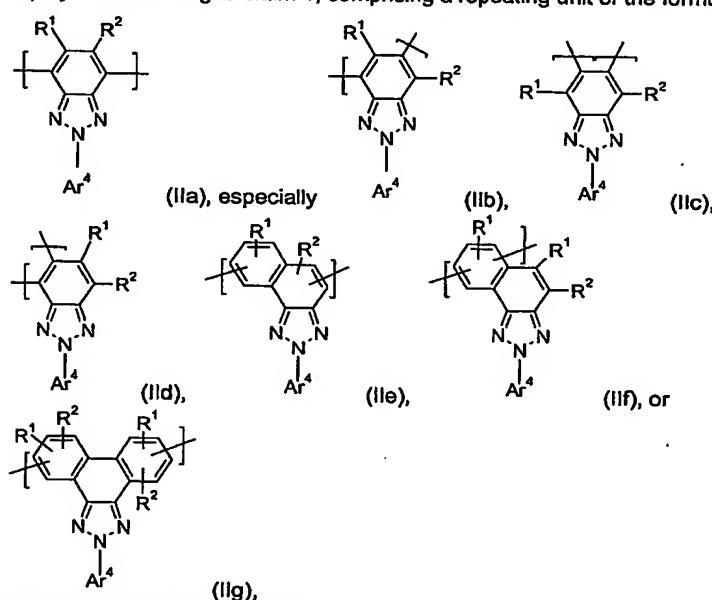
R^{27} and R^{28} are independently of each other H; C_6 - C_{18} aryl; C_6 - C_{18} aryl which is substituted by C_1 - C_{18} alkyl, or C_1 - C_{18} alkoxy; C_1 - C_{18} alkyl; or C_1 - C_{18} alkyl which is interrupted by $-O-$.

R^{29} is H; C_6 - C_{18} aryl; C_6 - C_{18} aryl, which is substituted by C_1 - C_{18} alkyl, or C_1 - C_{18} alkoxy; C_1 - C_{18} alkyl; or C_1 - C_{18} alkyl which is interrupted by $-O-$,

R^{30} and R^{31} are independently of each other C_1 - C_{18} alkyl, C_6 - C_{18} aryl, or C_6 - C_{18} aryl, which is substituted by C_1 - C_{18} alkyl, and

5 R^{32} is C_1 - C_{18} alkyl, C_6 - C_{18} aryl, or C_6 - C_{18} aryl, which is substituted by C_1 - C_{18} alkyl.

3. A polymer according to claim 1, comprising a repeating unit of the formula

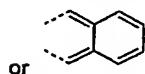


10 wherein Ar^4 is as defined in claim 1,

R^1 and R^2 are independently of each other H, halogen, SO_3^+ , C_1 - C_{18} alkyl, C_1 - C_{18} alkyl which is substituted by E and/or interrupted by D, C_1 - C_{18} perfluoroalkyl, C_6 - C_{24} aryl, C_6 - C_{24} aryl which is substituted by G, C_2 - C_{20} heteroaryl, C_2 - C_{20} heteroaryl which is

15 substituted by G, C_2 - C_{18} alkenyl, C_2 - C_{18} alkynyl, C_1 - C_{18} alkoxy, C_1 - C_{18} alkoxy which is substituted by E and/or interrupted by D, C_7 - C_{25} aralkyl, or $-CO-R^{28}$,

or two substituents R^1 and R^2 , which are adjacent to each other, are a group

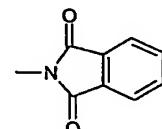


55

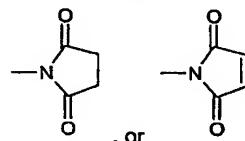
D is -CO-; -COO-; -S-; -SO-; -SO₂-; -O-; -NR²⁵-; -SIR³⁰R³¹-; -POR³²-; -CR²³=CR²⁴-; or -C≡C-; and

E is -OR²⁹; -SR²⁹; -NR²⁶R²⁸; -COR²⁸; -COOR²⁷; -CONR²⁶R²⁸; -CN; -OCOOR²⁷; or halogen; G is E, or C₁-C₁₈alkyl, wherein

5 R²³, R²⁴, R²⁶ and R²⁸ are independently of each other H; C₆-C₁₈aryl; C₆-C₁₈aryl which is substituted by C₁-C₁₈alkyl, or C₁-C₁₈alkoxy; C₁-C₁₈alkyl; or C₁-C₁₈alkyl which is interrupted by -O-; or



R²⁵ and R²⁶ together form a five or six membered ring, in particular



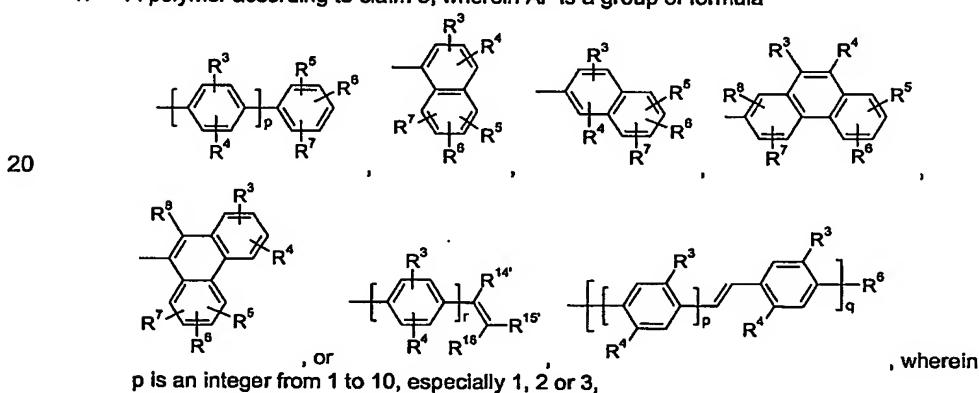
10 R²⁷ and R²⁸ are independently of each other H; C₆-C₁₈aryl; C₆-C₁₈aryl which is substituted by C₁-C₁₈alkyl, or C₁-C₁₈alkoxy; C₁-C₁₈alkyl; or C₁-C₁₈alkyl which is interrupted by -O-,

R²⁹ is H; C₆-C₁₈aryl; C₆-C₁₈aryl, which is substituted by C₁-C₁₈alkyl, or C₁-C₁₈alkoxy; C₁-C₁₈alkyl; or C₁-C₁₈alkyl which is interrupted by -O-,

15 R³⁰ and R³¹ are independently of each other C₁-C₁₈alkyl, C₆-C₁₈aryl, or C₆-C₁₈aryl, which is substituted by C₁-C₁₈alkyl, and

R³² is C₁-C₁₈alkyl, C₆-C₁₈aryl, or C₆-C₁₈aryl, which is substituted by C₁-C₁₈alkyl.

4. A polymer according to claim 3, wherein Ar⁴ is a group of formula



q is an integer from 1 to 10, especially 1, 2 or 3,

r is an integer of 0 to 10, in particular 0, 1, 2 or 3,

R³ to R⁸ are independently of each other H, halogen, SO₃⁻, C₁-C₁₈alkyl, C₁-C₁₈alkyl

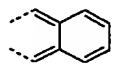
which is substituted by E and/or interrupted by D, C₆-C₂₄aryl, C₆-C₂₄aryl which is

5

substituted by G, C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, C₂-C₁₈alkenyl, C₂-C₁₈alkynyl, C₁-C₁₈alkoxy, C₁-C₁₈alkoxy which is substituted by E and/or interrupted by D, C₇-C₂₅aralkyl, or -CO-R²⁸, or



two substituents R³ to R⁸, which are adjacent to each other, are a group



, and

10

R¹⁴ and R¹⁵ are independently of each other H, C₁-C₁₈alkyl, C₁-C₁₈alkyl which is substituted by E and/or interrupted by D, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, or C₂-C₂₀heteroaryl which is substituted by G,

R¹⁸ is C₁-C₁₈alkyl, C₁-C₁₈alkyl which is substituted by E and/or interrupted by D, C₆-C₂₄aryl, which optionally can be substituted, wherein

15

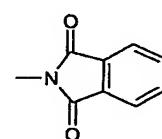
D is -CO-; -COO-; -S-; -SO-; -SO₂-; -O-; -NR²⁶-; -SiR³⁰R³¹-; -POR³²-; -CR²³=CR²⁴-; or -C≡C-; and

E is -OR²⁹; -SR²⁹; -NR²⁵R²⁸; -COR²⁸; -COOR²⁷; -CONR²⁵R²⁶; -CN; -OCOOR²⁷; or halogen; G is E, or C₁-C₁₈alkyl, wherein

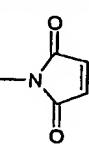
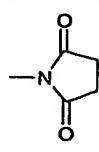
R²³, R²⁴, R²⁵ and R²⁸ are independently of each other H; C₆-C₁₈aryl; C₆-C₁₈aryl which is

20

substituted by C₁-C₁₈alkyl, C₁-C₁₈alkoxy; C₁-C₁₈alkyl; or C₁-C₁₈alkyl which is interrupted by -O-; or



R²⁵ and R²⁸ together form a five or six membered ring, in particular



, or

25

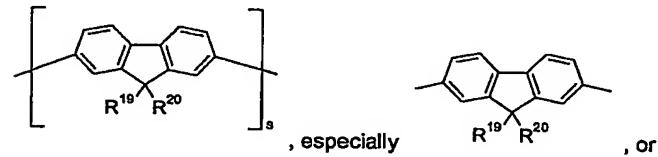
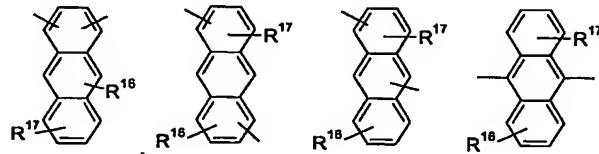
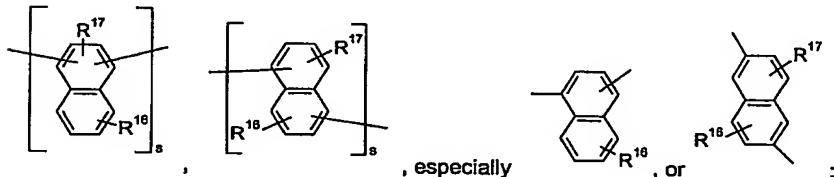
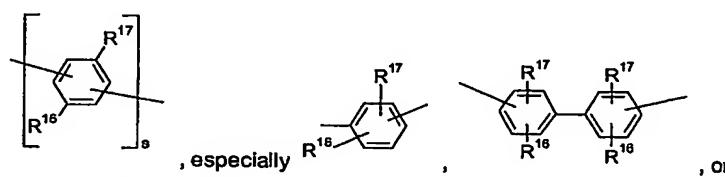
R²⁷ and R²⁸ are independently of each other H; C₆-C₁₈aryl; C₆-C₁₈aryl which is substituted by C₁-C₁₈alkyl, or C₁-C₁₈alkoxy; C₁-C₁₈alkyl; or C₁-C₁₈alkyl which is interrupted by -O-,

R^{29} is H; C_6 - C_{18} aryl; C_6 - C_{18} aryl, which is substituted by C_1 - C_{18} alkyl, C_1 - C_{18} alkoxy; C_1 - C_{18} alkyl; or C_1 - C_{18} alkyl which is interrupted by $-O-$,

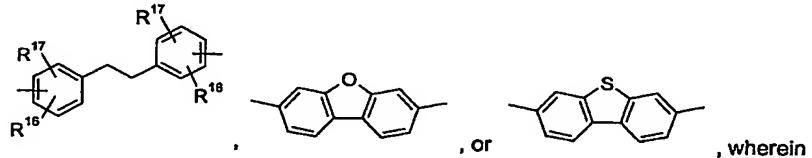
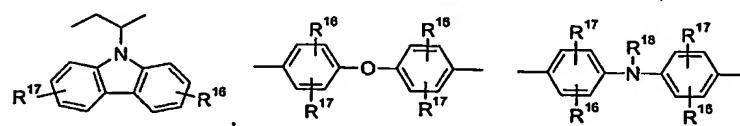
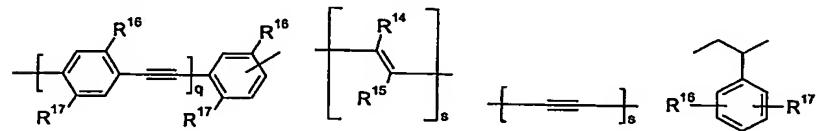
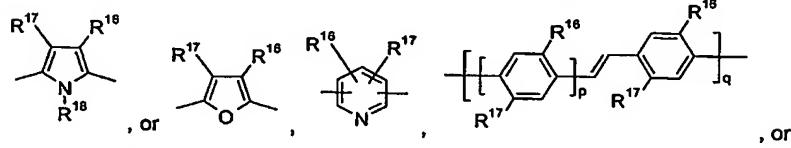
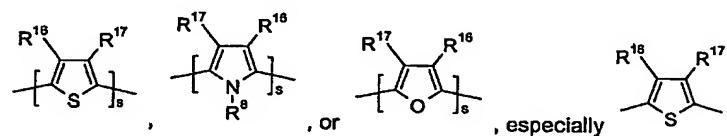
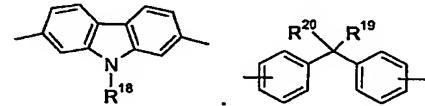
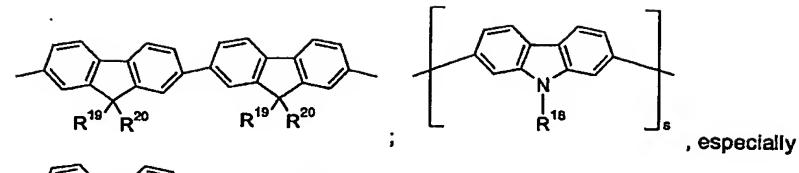
R^{30} and R^{31} are independently of each other C_1 - C_{18} alkyl, C_6 - C_{18} aryl, or C_6 - C_{18} aryl, which is substituted by C_1 - C_{18} alkyl, and

5 R^{32} is C_1 - C_{18} alkyl, C_6 - C_{18} aryl, or C_6 - C_{18} aryl, which is substituted by C_1 - C_{18} alkyl.

5. A polymer according to any of claims 1 to 4, comprising an additional repeating unit T which is selected from the group consisting of



58



p is an integer from 1 to 10, especially 1, 2 or 3,

q is an integer from 1 to 10, especially 1, 2 or 3,

10 s is an integer from 1 to 10, especially 1, 2 or 3,

R¹⁴ and R¹⁵ are independently of each other H, C₁-C₁₈alkyl, C₁-C₁₈alkyl which is substituted by E and/or interrupted by D, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, or C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G,

R¹⁶ and R¹⁷ are independently of each other H, C₁-C₁₈alkyl, C₁-C₁₈alkyl which is substituted by E and/or interrupted by D, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, or C₂-C₂₀heteroaryl which is substituted by G, C₂-C₁₈alkenyl, C₂-C₁₈alkynyl, C₁-C₁₈alkoxy, C₁-C₁₈alkoxy which is substituted by E and/or interrupted by D, C₇-C₂₅aralkyl, or -CO-R²⁸,

5 R¹⁸ is H; C₆-C₁₈aryl; C₆-C₁₈aryl which is substituted by C₁-C₁₈alkyl, or C₁-C₁₈alkoxy; C₁-C₁₈alkyl; or C₁-C₁₈alkyl which is interrupted by -O-;

10 R¹⁹ and R²⁰ are independently of each other C₁-C₁₈alkyl, C₁-C₁₈alkyl which is substituted by E and/or interrupted by D, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, C₂-C₁₈alkenyl, C₂-C₁₈alkynyl, C₁-C₁₈alkoxy, C₁-C₁₈alkoxy which is substituted by E and/or interrupted by D, or C₇-C₂₅aralkyl, or

15 R¹⁹ and R²⁰ together form a group of formula =CR¹⁰⁰R¹⁰¹, wherein

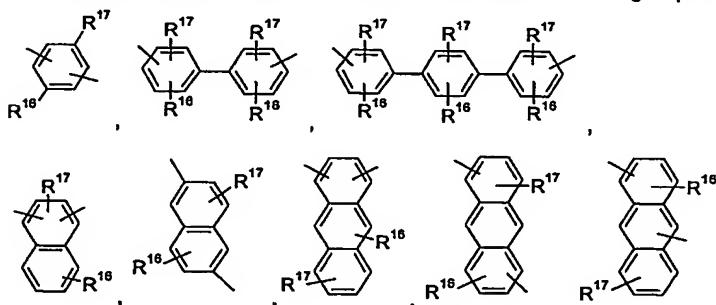
R¹⁰⁰ and R¹⁰¹ are independently of each other H, C₁-C₁₈alkyl, C₁-C₁₈alkyl which is

15 substituted by E and/or interrupted by D, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, or C₂-C₂₀heteroaryl which is substituted by G, or

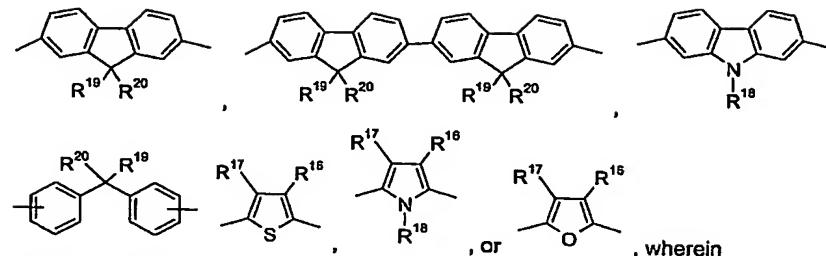
20 R¹⁹ and R²⁰ form a ring, especially a five- or six-membered ring, which can optionally be substituted, and

D, E and G are as defined in claim 2.

20 6. A polymer according to claim 5, wherein T is selected from the group consisting of

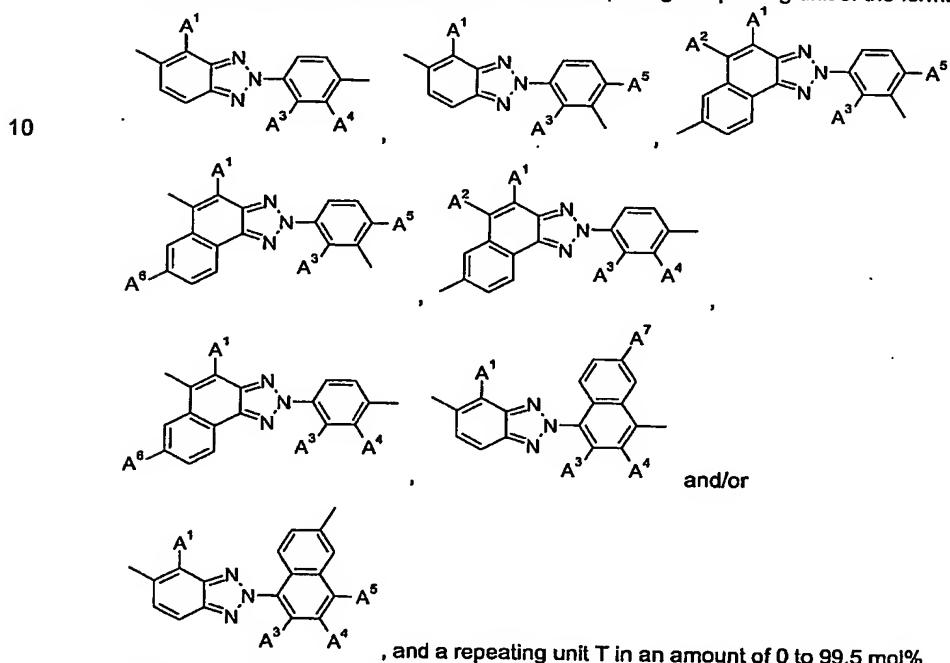


60

R¹⁸ is C₁-C₁₈alkyl, andR¹⁹ and R²⁰ are independently of each other C₁-C₁₈alkyl, especially C₄-C₁₂alkyl, which can be interrupted by one or two oxygen atoms, orR¹⁹ and R²⁰ form a five or six membered carbocyclic ring, which optionally can be substituted by C₁-C₄alkyl.

5

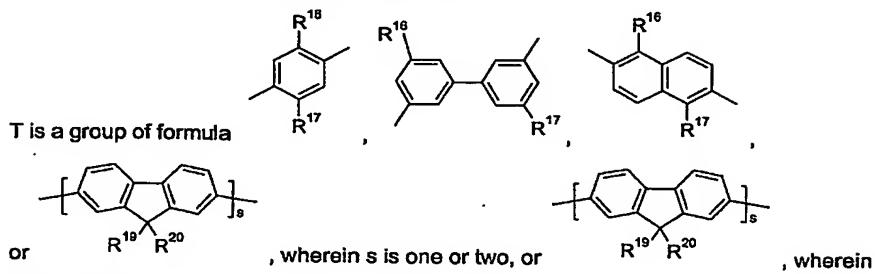
7. A polymer according to any of claims 1 to 6, comprising a repeating unit of the formula



15

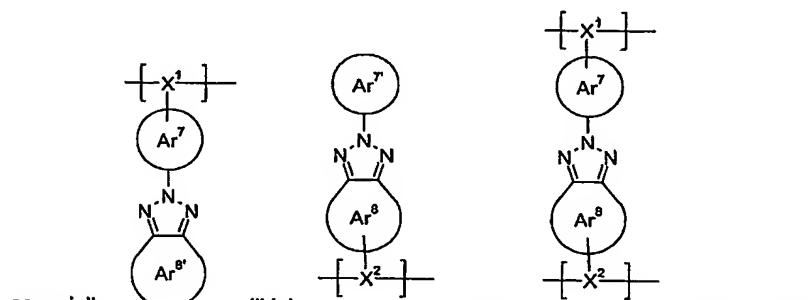
and a repeating unit T in an amount of 0 to 99.5 mol%, especially in an amount of 40 to 80 mol%, wherein the sum of the repeating unit(s) and the co-monomer is 100 mol%, wherein A¹ is hydrogen, or C₁-C₁₈alkyl,

A^2 is hydrogen, or C_1 - C_{18} alkyl,
 A^3 is hydrogen, or C_1 - C_{18} alkoxy, or C_1 - C_{18} alkyl,
 A^4 is hydrogen, or C_1 - C_{18} alkyl,
 A^5 is hydrogen, C_1 - C_{18} alkyl, di(C_1 - C_{18} alkyl)amino, or C_1 - C_{18} alkoxy,
 A^6 is hydrogen, or C_1 - C_{18} alkyl,
 A^7 is hydrogen, C_1 - C_{18} alkyl or C_1 - C_{18} alkoxy, and



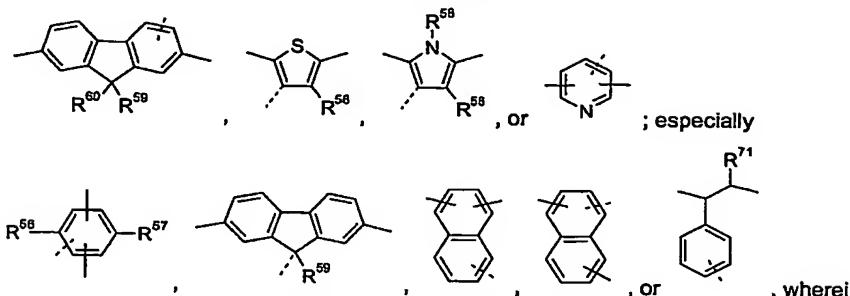
R^{18} and R^{17} are independently of each other C_1 - C_{18} alkyl, especially C_4 - C_{12} alkyl,
 especially hexyl, heptyl, 2-ethylhexyl, and octyl, which can be interrupted by one or two
 oxygen atoms, C_1 - C_{18} alkoxy, especially C_4 - C_{12} alkoxy, especially hexyloxy, heptyloxy, 2-
 ethylhexyloxy, and octyloxy, which can be interrupted by one or two oxygen atoms
 and R^{19} and R^{20} are independently of each other C_1 - C_{18} alkyl, especially C_4 - C_{12} alkyl,
 R^{19} and R^{20} especially hexyl, heptyl, 2-ethylhexyl, and octyl, which can be interrupted by one or two
 oxygen atoms.

8. A polymer according to claim 1, comprising a repeating unit of the formula IV,



Ar^7 , Ar^7 , Ar^8 and Ar^8' are independently of each other a C_6 - C_{30} aryl group, or a C_2 - C_{28} heteroaryl group, which can optionally be substituted,

62

 X^1 and X^2 are independently of each other a group of the formula

the dotted line represent the bond to the benzotriazole unit,

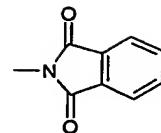
5 R^{58} and R^{57} are independently of each other H, C_1 - C_{18} alkyl, C_1 - C_{18} alkyl which is substituted by E and/or interrupted by D, C_6 - C_{24} aryl, C_6 - C_{24} aryl which is substituted by G, C_2 - C_{20} heteroaryl, C_2 - C_{20} heteroaryl which is substituted by G, C_2 - C_{18} alkenyl, C_2 - C_{18} alkynyl, C_1 - C_{18} alkoxy, C_1 - C_{18} alkoxy which is substituted by E and/or interrupted by D, or C_7 - C_{25} aralkyl,

10 R^{58} is H, C_1 - C_{18} alkyl, C_1 - C_{18} alkyl which is substituted by E and/or interrupted by D, C_6 - C_{24} aryl, or C_7 - C_{25} aralkyl,

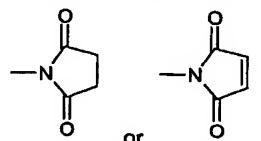
15 R^{59} and R^{60} are independently of each other H, C_1 - C_{18} alkyl, C_1 - C_{18} alkyl which is substituted by E and/or interrupted by D, C_6 - C_{24} aryl, C_6 - C_{24} aryl which is substituted by G, C_2 - C_{20} heteroaryl, C_2 - C_{20} heteroaryl which is substituted by G, C_2 - C_{18} alkenyl, C_2 - C_{18} alkynyl, C_1 - C_{18} alkoxy, C_1 - C_{18} alkoxy which is substituted by E and/or interrupted by D, or C_7 - C_{25} aralkyl, or

20 R^{59} and R^{60} form a ring, especially a five- or six-membered ring, which can optionally be substituted,

25 R^{71} is H, C_1 - C_{18} alkyl, $-C\equiv N$, $-CONR^{25}R^{26}$ or $-COOR^{27}$,
 D is $-CO$ -; $-COO$ -; $-OCOO$ -; $-S$ -; $-SO$ -; $-SO_2$ -; $-O$ -; $-NR^{25}$ -; $-SiR^{30}R^{31}$ -; $-POR^{32}$ -; $-CR^{23}=CR^{24}$ -; or $-C\equiv C$ -; and
 E is $-OR^{29}$; $-SR^{29}$; $-NR^{25}R^{26}$; $-COR^{28}$; $-COOR^{27}$; $-CONR^{25}R^{26}$; $-CN$; $-OCOOR^{27}$; or
halogen; G is E, or C_1 - C_{18} alkyl, wherein
 R^{23} , R^{24} , R^{25} and R^{26} are independently of each other H; C_6 - C_{18} aryl; C_6 - C_{18} aryl which is substituted by C_1 - C_{18} alkyl, C_1 - C_{18} alkoxy; C_1 - C_{18} alkyl; or C_1 - C_{18} alkyl which is interrupted by $-O$ -; or



R²⁵ and R²⁶ together form a five or six membered ring, in particular



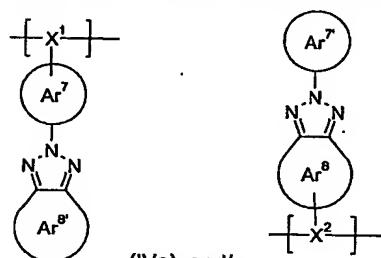
R²⁷ and R²⁸ are independently of each other H; C₆-C₁₈aryl; C₆-C₁₈aryl which is substituted by C₁-C₁₈alkyl, or -C₁₈alkoxy; C₁-C₁₈alkyl; or C₁-C₁₈alkyl which is interrupted by -O-, and

5 R²⁹ is H; C₆-C₁₈aryl; C₆-C₁₈aryl which is substituted by C₁-C₁₈alkyl, C₁-C₁₈alkoxy; C₁-C₁₈alkyl; or C₁-C₁₈alkyl which is interrupted by -O-,

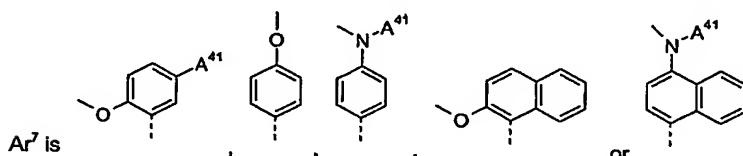
10 R³⁰ and R³¹ are independently of each other C₁-C₁₈alkyl, C₆-C₁₈aryl, or C₆-C₁₈aryl, which is substituted by C₁-C₁₈alkyl, and

R³² is C₁-C₁₈alkyl, C₆-C₁₈aryl, or C₆-C₁₈aryl, which is substituted by C₁-C₁₈alkyl.

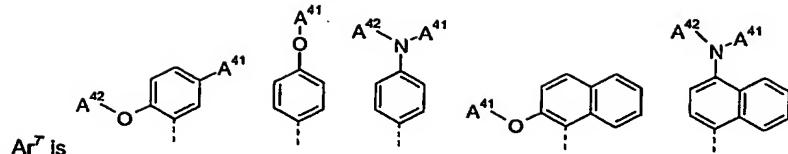
9. A polymer according to claim 8, comprising a repeating unit of the formula



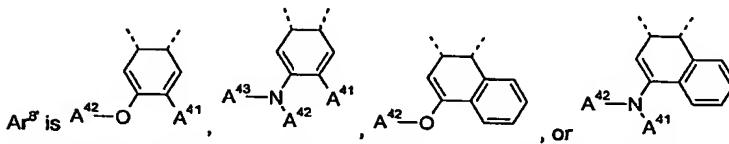
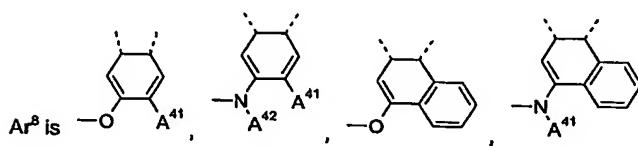
(IVa), and/or (IVb), and a repeating unit T in an amount of 0 to 99.5 mol%, especially in an amount of 40 to 80 mol%, wherein the sum of the repeating unit(s) and the co-monomer is 100 mol%, wherein



64

Ar⁷ is

wherein the dotted line is the bond to the nitrogen atom of the benzotriazole unit,



5

wherein the dotted lines are the bonds to the nitrogen atoms of the benzotriazole unit,

A⁴¹ is hydrogen, C₁-C₁₈alkoxy, or C₁-C₁₈alkyl, such as methyl, ethyl, n-propyl, iso-propyl, n-butyl, isobutyl, sec-butyl, t-butyl, 2-methylbutyl, n-pentyl, isopentyl, n-hexyl, 2-ethylhexyl, or n-heptyl,

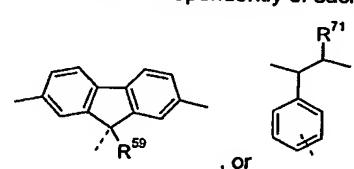
A⁴² is hydrogen, or C₁-C₁₈alkyl, such as methyl, ethyl, n-propyl, iso-propyl, n-butyl,

10 isobutyl, sec-butyl, t-butyl, 2-methylbutyl, n-pentyl, isopentyl, n-hexyl, 2-ethylhexyl, or n-heptyl,

A⁴³ is hydrogen, or C₁-C₁₈alkyl, such as methyl, ethyl, n-propyl, iso-propyl, n-butyl,

isobutyl, sec-butyl, t-butyl, 2-methylbutyl, n-pentyl, isopentyl, n-hexyl, 2-ethylhexyl, or n-heptyl,

15 X¹ and X² are independently of each other a group of the formula

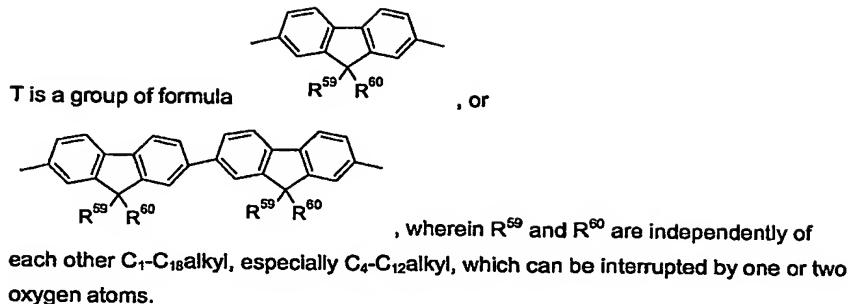


, or , wherein the dotted line represent the bond to the benzotriazole unit,

R⁷¹ is H, C₁-C₁₈alkyl, -C≡N, or -COOR²⁷, wherein

20 R²⁷ is H; or C₁-C₁₈alkyl, which can be interrupted by one or more oxygen atoms, especially C₄-C₁₂alkyl, which can be interrupted by one or two oxygen atoms, and

65



5

10. An optical device or a component therefore, comprising a substrate and a polymer according to any of claims 1 to 9.

10

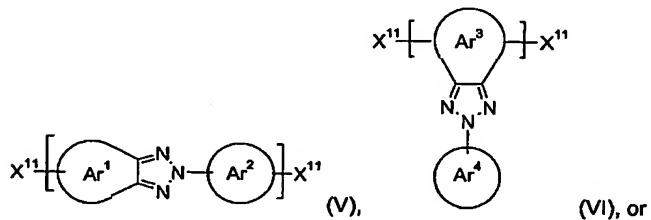
11. An optical device according to claim 10, wherein the optical device comprises an electroluminescent device.

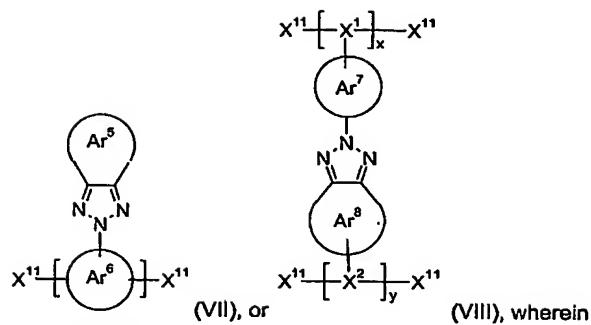
12. An optical device according to claim 11, wherein the electroluminescent device comprises

- (a) a reflective or transmissive anode
- (b) a reflective or transmissive cathode
- (c) an emissive layer comprising a polymer according to any of claims 1 to 9 located between the electrodes, and optionally
- (d) a charge injecting layer for injecting positive charge carriers, and
- (e) a charge injecting layer for injecting negative charge carriers.

15

20. 13. A monomer of the formula



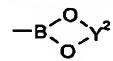


x and y are 0 or 1,

Ar^1 , Ar^2 , Ar^3 , Ar^4 , Ar^5 , Ar^6 , Ar^7 and Ar^8 are independently of each other an aryl group, or a heteroaryl group, which optionally can be substituted, especially a $\text{C}_6\text{-C}_{30}$ aryl group, or a $\text{C}_2\text{-C}_{20}$ heteroaryl group, which can optionally be substituted, and

5

X^{11} is independently in each occurrence a halogen atom, or $-B(OH)_2$, $-B(OY^1)_2$, or



, wherein Y¹ is independently in each occurrence a C₁-C₁₀alkyl group and Y² is independently in each occurrence a C₂-C₁₀alkylene group, such as - CY³Y⁴-CY⁵Y⁶-, or -CY⁷Y⁸-CY⁹Y¹⁰- CY¹¹Y¹²-, wherein Y³, Y⁴, Y⁵, Y⁶, Y⁷, Y⁸, Y⁹, Y¹⁰, Y¹¹ and Y¹² are independently of each other hydrogen, or a C₁-C₁₀alkyl group, especially -C(CH₃)₂C(CH₃)₂- or -C(CH₃)₂CH₂C(CH₃)₂-.